

Access DB# 103620  
# 2

# SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Leslie Wong Examiner #: 108806 Date: 9/10/03  
Art Unit: 1761 Phone Number 30 8-1879 Serial Number: 101006822  
Mail Box and Bldg/Room Location: C83 5E06 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

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Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Ethyl 4-(thioacetoxyl) butyrate as a flavoring agent and methods for preparing and using same

Inventors (please provide full names): \_\_\_\_\_

Mark Lawrence Lewis

Earliest Priority Filing Date: 4/5/2000

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

ethyl 4-(thioacetoxyl) butyrate  
( $\text{CH}_3\text{COS}(\text{CH}_2)_3\text{COOCH}_2\text{CH}_3$ )

as a flavorant or  
just the compound (claims 13+14)

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	Type of Search	Vendors and cost where applicable
Searcher: <u>Ed</u>	NA Sequence (#) _____	STN <u>\$ 70.76</u>
Searcher Phone #: _____	AA Sequence (#) _____	Dialog _____
Searcher Location: _____	Structure (#) <u>(1)</u>	Questel/Orbit _____
Date Searcher Picked Up: _____	Bibliographic <u>(and)</u>	Dr Link _____
Date Completed: <u>9-11-03</u>	Litigation _____	Lexis/Nexis _____
Searcher Prep & Review Time: <u>5</u>	Fulltext _____	Sequence Systems _____
Clerical Prep Time: _____	Patent Family _____	WWW/Internet _____
Online Time: <u>65</u>	Other _____	Other (specify) _____

We claim:

1. A method for flavoring an ingestible composition which comprises admixing an ingestible vehicle with an organoleptically effective amount of ethyl 4-(thioacetoxyl)butyrate represented by the formula,  $\text{CH}_3\text{COS}(\text{CH}_2)_3\text{COOCH}_2\text{CH}_3$ .

2. The method according to claim 1, wherein ethyl 4-(thioacetoxyl)butyrate is present in the ingestible composition in an amount from about 0.001% to about 1%, by weight.

3. The method according to claim 2, wherein ethyl 4-(thioacetoxyl)butyrate is present in the ingestible composition in an amount from about 0.1% to about 0.50%, by weight.

4. The method according to claim 1, wherein the ingestible composition is a beverage product.

5. The method according to claim 1, wherein the ingestible composition is a confectionery composition.

6. The method according to claim 1, wherein the ingestible composition is a chewing gum.

7. An ingestible composition comprising:

(i) an ingestible vehicle; and

(ii) an organoleptically effective amount of ethyl 4-(thioacetoxyl)butyrate represented by the formula,  $\text{CH}_3\text{COS}(\text{CH}_2)_3\text{COOCH}_2\text{CH}_3$ .

8. The ingestible composition according to claim 7, wherein ethyl 4-(thioacetoxyl)butyrate is present in the ingestible composition in an amount from about 0.001% to about 1%, by weight.

9. The ingestible composition according to claim 8, wherein ethyl 4-(thioacetoxyl)butyrate is present in the ingestible composition in an amount from about 0.1% to about 0.50%, by weight.

10. The ingestible composition according to claim 7, wherein the ingestible composition is a beverage product.

11. The ingestible composition according to claim 7, wherein the ingestible composition is a confectionery composition.

5 12. The ingestible composition according to claim 7, wherein the ingestible composition is a chewing gum.

13. Ethyl 4-(thioacetoxy)butyrate represented by the formula,  
 $\text{CH}_3\text{COS}(\text{CH}_2)_3\text{COOCH}_2\text{CH}_3$ .

10

14. A method for preparing ethyl 4-(thioacetoxy)butyrate which comprises reacting ethyl 4-chlorobutyrate with potassium thioacetate.

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FILE 'REGISTRY' ENTERED AT 16:31:48 ON 11 SEP 2003  
E ETHYL 4-(THIOACETOXY)BUTYRATE/CN  
E C8H14O3S/MF

L1 FILE 'HCAPLUS' ENTERED AT 16:35:21 ON 11 SEP 2003  
11 S DEWIS M?/AU  
SEL L1 1-11 RN

L2 FILE 'REGISTRY' ENTERED AT 16:35:31 ON 11 SEP 2003  
47 S E1-E47  
L3 7 S L2 AND S/ELS  
L4 4 S L3 AND ETHYL  
L5 3 S L4 AND ESTER  
SEL  
L5 3 RN  
L6 1 S E48

L7 FILE 'ZCAPLUS' ENTERED AT 16:38:36 ON 11 SEP 2003  
4 S L6

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0 S L6

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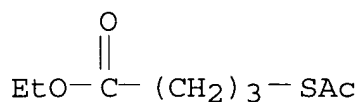
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L7 ANSWER 1 OF 4 ZCAPLUS COPYRIGHT 2003 ACS on STN  
ACCESSION NUMBER: 2001:762745 ZCAPLUS  
DOCUMENT NUMBER: 135:303112  
TITLE: Ethyl 4-(thioacetoxyl)butyrate as a flavoring  
agent and methods for preparing and using it  
INVENTOR(S): Dewis, Mark Lawrence  
PATENT ASSIGNEE(S): ~~Bush Boake Allen Inc.~~, USA  
SOURCE: PCT Int. Appl., 41 pp.

CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001076389	A1	20011018	WO 2001-US40449	20010404
W: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GE, HU, IN, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
GB 2364231	A1	20020123	GB 2000-8443	20000405
EP 1276391	A1	20030122	EP 2001-927438	20010404
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
US 2002090435	A1	20020711	US 2001-6822	20011204
PRIORITY APPLN. INFO.:				
			GB 2000-8443	A 20000405
			WO 2001-US40449	W 20010404
AB	Et 4-(thioacetoxyl)butyrate, a natural flavorant in mango fruit, may be synthesized and used to flavor chewing gum compns., hard and soft confections, beverage products, etc. The flavoring material is synthesized by reacting Et 4-chlorobutyrate with potassium thioacetate. Thus, coffee flavor with 0.2% Et 4-(thioacetoxyl)butyrate gave a more fresh-brewed, darker roasted character to the beverage.			
IT	<b>104228-51-5P</b> (Et (thioacetoxyl)butyrate as flavoring agent)			
RN	104228-51-5 ZCAPLUS			
CN	Butanoic acid, 4-(acetylthio)-, ethyl ester (9CI) (CA INDEX NAME)			



IT **104228-51-5P**  
 (Et (thioacetoxyl)butyrate as flavoring agent)  
 REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 2 OF 4 ZCAPLUS COPYRIGHT 2003 ACS on STN  
 ACCESSION NUMBER: 1995:996631 ZCAPLUS  
 DOCUMENT NUMBER: 124:56410

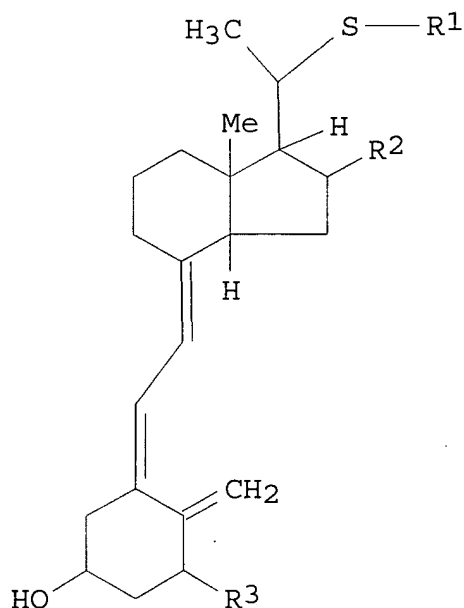
TITLE: Preparation of 22-thiavitamin D3 derivatives as  
 keratinocyte growth inhibitors  
 INVENTOR(S): Kubodera, Noboru; Kawase, Akira  
 PATENT ASSIGNEE(S): Chugai Seiyaku Kabushiki Kaisha, Japan  
 SOURCE: PCT Int. Appl., 86 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9527697	A1	19951019	WO 1995-JP699	19950410
W: AM, AU, BB, BG, BR, BY, CA, CN, CZ, EE, FI, GE, HU, IS, KE, KG, KR, KZ, LK, LR, LT, LV, MD, MG, MN, MW, MX, NO, NZ, PL, RO, RU, SD, SG, SI, SK, TJ, TM, TT, UA, US, UZ, VN				
RW: KE, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
AU 9521482	A1	19951030	AU 1995-21482	19950410
JP 07330714	A2	19951219	JP 1995-155079	19950410
EP 755922	A1	19970129	EP 1995-914550	19950410
EP 755922	B1	20000816		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LI, LU, MC, NL, PT, SE				
CN 1148380	A	19970423	CN 1995-193058	19950410
CN 1046502	B	19991117		
BR 9507355	A	19970909	BR 1995-7355	19950410
RU 2142941	C1	19991220	RU 1996-121801	19950410
AT 195513	E	20000915	AT 1995-914550	19950410
ES 2150560	T3	20001201	ES 1995-914550	19950410
US 5824811	A	19981020	US 1996-718499	19961001

PRIORITY APPLN. INFO.:

JP 1994-107366 A 19940411  
 JP 1994-107336 A 19940411  
 WO 1995-JP699 W 19950410

OTHER SOURCE(S): MARPAT 124:56410  
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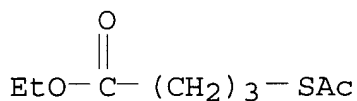
AB Compds. represented by general formula I [R1 represents optionally hydroxylated C1-C10 alkyl; R2 represents hydrogen or hydroxy; and R3 represents hydrogen or hydroxy], vitamin D derivs. substituted by a sulfur atom at the 22-position and having a potent keratinocyte growth inhibitor effect, are prepd. Thus, 1.alpha.,3.beta.-bis(tert-butyl dimethylsilyloxy)-17-oxoandrosta-5,7-diene in THF contg. KOCMe3 was treated with 2-(phenylsulfonyl)-3-phenyloxaziridine at -78.degree. for 1.5 h to give 1.alpha.,3.beta.-bis(tert-butyl dimethylsilyloxy)-16.alpha.-hydroxy-17-oxoandrosta-5,7-diene, which was treated with EtPPh3Br in THF contg. KOCMe3 to give 1.alpha.,3.beta.-bis(tert-butyl dimethylsilyloxy)-16.alpha.-hydroxypregna-5,7,17(E)-triene and its 17(Z) isomer. The 17(E) isomer was treated with HCO2CCl3-DMSO to give 1.alpha.,3.beta.-bis(tert-butyl dimethylsilyloxy)-16-oxopregna-5,7,17(E)-triene, which was reacted with 3-ethyl-3-hydroxy-1-pentanethiol in THF to give a mixt. of 20(S)- and 20(R)-1.alpha.,3.beta.-bis(tert-butyl dimethylsilyloxy)-20-(3-ethyl-3-hydroxypentylthio)-16-oxopregna-5,7-diene. The 20(S) isomer was reduced with LiAlH4 to give a mixt. of 16.alpha.- and 16.beta.-20(S)-1.alpha.,3.beta.-bis(tert-butyl dimethylsilyloxy)-20-(3-ethyl-3-hydroxypentylthio)-16-hydroxypregna-5,7-diene. The 16.alpha. isomer was treated with Bu4NF in THF and the resulting trihydroxy compd. was irradiated in EtOH with a 400W high pressure Hg lamp for 2.5 min to give the title compd. 20(S)-(3-ethyl-3-hydroxypentylthio)-1.alpha.,3.beta.,16.alpha.-trihydroxy-9,10-secopregna-5,7,10(19)triene. In an in vitro study, the inhibitory effect of this on the growth of human keratinocytes was comparable to that of 1.alpha.,25-dihydroxyvitamin D3.

IT 104228-51-5P

(prepn. of thiavitamin D3 derivs. as keratinocyte growth inhibitors)

RN 104228-51-5 ZCAPLUS

CN Butanoic acid, 4-(acetylthio)-, ethyl ester (9CI) (CA INDEX NAME)



IT 104228-51-5P

(prepn. of thiavitamin D3 derivs. as keratinocyte growth inhibitors)

L7 ANSWER 3 OF 4 ZCAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1987:32678 ZCAPLUS

DOCUMENT NUMBER: 106:32678

TITLE: The chemistry of alkyl thiosulfinate esters. 9. Antithrombotic organosulfur compounds from garlic: structural, mechanistic, and synthetic studies

AUTHOR(S): Block, Eric; Ahmad, Saleem; Catalfamo, James L.; Jain, Mahendra K.; Apitz-Castro, Rafael  
CORPORATE SOURCE: Dep. Chem., State Univ. New York, Albany, NY, 12222, USA

SOURCE: Journal of the American Chemical Society (1986), 108(22), 7045-55  
CODEN: JACSAT; ISSN: 0002-7863

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 106:32678

AB Garlic (*Allium sativum*) exts. contain a compd. termed ajoene (I), which, among other compds. from garlic, is a potent inhibitor of platelet aggregation. The structure of I was detd. by spectroscopic methods to be (E and Z)-4,5,9-trithiadodeca-1,6,11-triene 9-oxide. I was synthesized by decompn. of allicin in aq. Me<sub>2</sub>CO. A detailed mechanism is presented for the thermal decompn. of allicin. I was oxidized to its 9,9-dioxide, 4,9,9-trioxide, and 4,4,9,9-tetraoxide. An attempted synthesis of the ajoene isomer (E)-4,5,9-trithiadodeca-1,7,11-triene 9-oxide led instead to a sulfine by way of the sulfoxide thio-Claisen rearrangement. Decompn. of the garlic component CH<sub>2</sub>:CHCH<sub>2</sub>SS(O)Me led to various homologs of I. Several I homologs in which the 6,7-double bond has been replaced by an o-C<sub>6</sub>H<sub>4</sub> group have been prepd. from 2-HSC<sub>6</sub>H<sub>4</sub>CO<sub>2</sub>H. The antithrombotic activity of a variety of structures related to I has been used to explain the mol. basis for antithrombotic activity of I, which is attributed to its ability to alter platelet membranes by capturing SH groups.

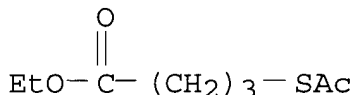
IT 104228-51-5P

(prepn. and chlorination of)

RN 104228-51-5 ZCAPLUS



CN Butanoic acid, 4-(acetylthio)-, ethyl ester (9CI) (CA INDEX NAME)



IT **104228-51-5P**  
(prepn. and chlorination of)

L7 ANSWER 4 OF 4 ZCAPLUS COPYRIGHT 2003 ACS on STN  
 ACCESSION NUMBER: 1986:533346 ZCAPLUS  
 DOCUMENT NUMBER: 105:133346  
 TITLE: Organic trithio oxides  
 INVENTOR(S): Block, Eric; Ahmad, Saleem  
 PATENT ASSIGNEE(S): State University of New York, Research  
 Foundation, USA  
 SOURCE: Eur. Pat. Appl., 29 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 185324	A2	19860625	EP 1985-115902	19851213
EP 185324	A3	19871021		
R: AT, BE, CH, DE, FR, GB, IT, LI, NL				
US 4643994	A	19870217	US 1984-682435	19841217

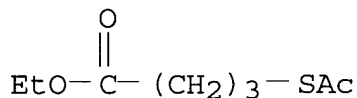
PRIORITY APPLN. INFO.: US 1984-682435 19841217  
 OTHER SOURCE(S): CASREACT 105:133346

AB The title compds. R1XR1R1 [R = CH2CH:CH, CH2CMe:CH, CH(CH:CH2), (CH2)3; R1 = alkoxy, alkylthio, carboxyalkyl, NH2, etc.; X = SO, SO2; X1 = S2, S(O), SS(O2)] useful as antibiotics and antithrombotics, were prepd. Thus, (H2C:CHCH)2S was treated with MeCO2OH in CHCl3 at 0.degree. to give H2C:CHCH2SS(O)CH2CH:CH2 which in Me2CO and H2O at 45-46.degree. gave (E,Z)-H2C:CHCH2SSCH:CHCH2S(O)CH2CH:CH2 which was reacted with MeCO2OH in CHCl3 to give (E,Z)-H2C:CHCH2S(O2)SCH:CHCH2S(O)CH2CH:CH2. This compd. at 1.0 mM concn. killed Staphylococcus aureus bacteria. The antithrombotic activity was also demonstrated.

IT **104228-51-5P**  
(prepn. and conversion to sulfinyl chloride)

RN 104228-51-5 ZCAPLUS

CN Butanoic acid, 4-(acetylthio)-, ethyl ester (9CI) (CA INDEX NAME)



IT 104228-51-5P  
(prepn. and conversion to sulfinyl chloride)

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FILE 'REGISTRY' ENTERED AT 16:40:08 ON 11 SEP 2003

	E 4-CHLOROBUTYRATE/CN
	E ETHYL 4-CHLOROBUTYRATE/CN
L9	1 S E3
	E LITHIUM THIOACETATE/CN
	E SODIUM THIOACETATE/CN
L10	1 S E3
	E ETHANETHIOIC ACID, LITHIUM SALT/CN
L11	1 S E3
	E ETHANETHIOIC ACID, POTASSIUM SALT/CN
L12	1 S E3

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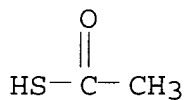
L13	160 S L9
L14	668 S L10 OR L11 OR L12
L15	1 S L13 AND L14

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L15 ANSWER 1 OF 1 ZCAPLUS COPYRIGHT 2003 ACS on STN  
2001:762745 Document No. 135:303112 Ethyl 4-(thioacetoxo)butyrate as a  
flavoring agent and methods for preparing and using it. Dewis, Mark  
Lawrence (Bush Boake Allen Inc., USA). PCT Int. Appl. WO 2001076389  
A1 20011018, 41 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BB,  
BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GE, HU, IN, IS, JP,  
KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX,  
NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG,  
US, UZ, VN, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ,  
CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU,  
MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN:  
PIXXD2. APPLICATION: WO 2001-US40449 20010404. PRIORITY: GB  
2000-8443 20000405.

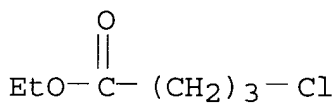
AB Et 4-(thioacetoxo)butyrate, a natural flavorant in mango fruit, may  
be synthesized and used to flavor chewing gum compns., hard and soft  
confections, beverage products, etc. The flavoring material is  
synthesized by reacting Et 4-chlorobutyrate with potassium  
thioacetate. Thus, coffee flavor with 0.2% Et 4-  
(thioacetoxo)butyrate gave a more fresh-brewed, darker roasted  
character to the beverage.

IT 10387-40-3, Potassium thioacetate  
(reaction with Et chlorobutyrate)  
RN 10387-40-3 ZCAPLUS  
CN Ethanethioic acid, potassium salt (9CI) (CA INDEX NAME)



K

IT 3153-36-4, Ethyl 4-chlorobutyrate  
(reaction with potassium thioacetate)  
RN 3153-36-4 ZCAPLUS  
CN Butanoic acid, 4-chloro-, ethyl ester (9CI) (CA INDEX NAME)



IT 10387-40-3, Potassium thioacetate  
(reaction with Et chlorobutyrate)  
IT 3153-36-4, Ethyl 4-chlorobutyrate  
(reaction with potassium thioacetate)